

U.S. NAVY MEDICINE

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**Nurse Remembers
POW Years**

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Reservist Recalls Battlewagon Duty

If the battleship *New Jersey* needs the assistance of a Naval Reserve medical officer when it rejoins the fleet next year, then the commanding officer of a Reserve unit should be at the top of the list.

He's CDR Louis A. Ivey II of Silver Spring, MD, who nearly 28 years ago saw his first active duty tour in the Navy aboard the ship. Today, the 50-year-old physician is Chief of Surgery at Baltimore's Provident Hospital and Associate Professor of Surgery at Meharry Medical College, but his rich memories of his days aboard the battleship and news of its reactivation are making him anxious to walk its teak decks once again.

"It's bringing back a lot of memories," recalled Dr. Ivey, Commanding Officer of Naval Reserve Surgical Team 106 headquartered in Adelphi, MD, during a recent drill weekend. "If you served aboard a ship like the *'Jersey*, your memories of it, your images of it, are quite vivid. The *New Jersey* represents the Navy as far as I'm concerned."

Perhaps because the ship was so huge—887 feet long—and its crew so large—2,878 during wartime—Ivey said his recollections are so vivid. "You're one big family aboard a ship like that. You're not always happy, like in any family, but you are one big family nonetheless."

Dr. Ivey recalls the bone-numbing chill of the North Atlantic which seemed to pierce his heavy black coat as if the coat wasn't there. And he remembers the opposite sensation from his duty in the ship's engine room, where the heat was intense regardless of the weather topside.

It was the value of those lessons, the friendships he forged aboard the Norfolk-based ship, and a sense of obligation to the Navy and the Nation that lured him back to the Navy decades later. At that time, Ivey had returned to Washington to teach at his alma mater, the Howard University College of Medicine.

Though he had his hands full as an assistant professor of surgery, Ivey agreed to serve as an unpaid "commandant's representative" and help the Navy find qualified doctors for the fleet. He served as a model for recruiting ads for "The New Navy" that appeared in many of the Nation's major black magazines.

"He's someone special—in the Navy or out of it," said the full-page advertisements. "... Yes, you can be Black and Navy too."

About the time the ads appeared someone suggested to Ivey, who had left the Naval Reserve after completing medical school, that he could return to the Reserve program and get paid for helping the Navy medical programs. Several months later he was back in his Navy blues, holding the rank of commander as a reservist in the Medical Corps.

When he reported for duty aboard *New Jersey* in 1954, Ivey was an ensign, fresh out of Pennsylvania State University, a line officer, and the only black in the ship's company of 169 officers.

That was the year the Supreme Court was to outlaw segregation in public schools and the Navy had a long way to go toward improving its race relations. The day after he joined the ship the white officer



CDR Ivey remembers his days on the battleship New Jersey.

assigned to share his stateroom moved out—without any explanation.

"The thing I learned there was how to get along and survive in the Navy," he said during a break in a recent medical officers' conference at the Washington Navy Yard. "You learn that you have to work at some things at two different levels. You work at some things on a social level and some things on a professional level. When the social things didn't work out you eliminated the social contacts and worked on the professional side."

After 2 years aboard the battleship Ivey received a choice shore assignment as an assistant officer in charge



Dr. Ivey visits a patient after surgery.

of the Navy's Rhine River Patrol in Germany. It was a job that placed him in charge of approximately 200 people—100 sailors and 100 German nationals who helped the Navy guard a sector of the European waterway.

After his tour ended in 1958 he left the Navy to return to Washington to follow in his father's footsteps toward a medical career. Ivey was only 3 when his father, Louis A. Ivey, a prominent physician, was killed in an automobile accident, but few in the family doubted that the youngster would enter medicine.

After his graduation from Howard in 1963, Ivey joined the commissioned officers corps of the Public Health Service and rose to the rank of "senior surgeon," the equivalent of lieutenant commander. He was in the corps for 6 years, serving at a hos-

pital that helped merchant seaman, members of the Coast Guard, and American Indians.

Since rejoining the Naval Reserve in 1971, he has served with several medical units and has commanded two of them. His current unit, based at the Adelphi Reserve Center, often drills at NNMC Bethesda; it is a 35-member unit that includes four physicians and is rated as "one of the best" Reserve units of its kind in the Naval Reserve Readiness Command Region Six area, according to CAPT C. Joseph Gibbs, Jr., the command's staff medical officer.

Ivey, who last year recruited his eldest son, Louis, into the Navy medical scholarship program, manages to devote considerable time to his Reserve duties. In the past 2 years he has performed 30 days'

temporary duty at U.S. NRMC Yokosuka, Japan, serving as thoracic and cardiovascular surgeon during two Presidential trips to Japan and aboard the aircraft carrier *Midway*.

In all, Ivey has watched the Navy for more than a quarter of a century. Has the service's race relations improved as much as he would like?

The over 6-foot-tall officer pauses. "The Navy, from a paper point of view, has fully accepted its duties and obligations. But the implementation of these policies, of course, falls back on individuals and you are going to encounter problems from place to place and from time to time. Problems tend to be with individuals basically, and irrespective of rank."

—Story by CDR William H. McAllister III, USNR □

Civilian-Military Contingency Hospital System

CAPT E. Lee Taylor, MC, USN

CDR L. Doptis, MSC, USN

All Navy Medical Department personnel should become familiar with the Civilian-Military Contingency Hospital System (CMCHS). The system has been designed as a cost-effective program to provide medical support in a military emergency should casualties in a conflict exceed the military and Veterans Administration bed capacity.

Modern firepower with computerized accuracy in a conventional warfare conflict could produce high casualty rates. The development of CMCHS will prevent the unnecessary cost of expanding military hospital systems to provide beds which would remain empty until needed. Available beds already exist at many civilian hospitals.

The following Department of Defense fact sheet on CMCHS provides background information for Navy Medical Department personnel.

Fact Sheet

Within the past 75 years the United States has been engaged in four armed conflicts abroad. Each has required various levels of medical support for U.S. military forces. In all four conflicts, there was sufficient time for the peacetime

military medical support system to be expanded to meet emerging needs. In the future, however, should an overseas conflict begin quickly, it might not be possible to expand the existing peacetime military medical system in time to provide care for all the casualties returning to the United States during the early stages.

To insure that adequate medical care would be available to military personnel in this situation, several solutions were examined during the mid-1970's. The present Federal health care system could be enlarged to meet the expected need, but this would be extremely expensive and inefficient. A "mothballed" medical system, putting facilities and equipment in storage until the need arises, would require a great initial investment, constant monitoring, and periodic expensive replacement of equipment and supplies. Neither of these alternatives provided an acceptable solution.

Attention then shifted to the civilian sector, with the realization that the use of existing civilian hospitals to treat war casualties could be an effective, cost-efficient method to provide required medical care to back up the Federal system. It was necessary to devise a peacetime system that could tap the potential of the civilian sector during a time of national emergency. If certain civilian sector hospital beds, facilities, and personnel could be assured, Defense and Veterans Administration medical planners would have a base from which to estimate any residual requirement for Federal medical facilities and personnel.

In 1978 a study by the Department of Defense concluded that civilian hospitals

could be used effectively for an interim period during a military emergency, assuming that the Department of Defense used only a portion of the medical personnel and facilities of any single civilian hospital. The General Accounting Office, at the request of Congress, reviewed the program in June 1980. Its report recommended that Congress mandate the formation of a Civilian-VA-Military Contingency Hospital System. In response to this, in 1980, the Secretary of Defense directed the development of the Civilian-Military Contingency Hospital System (CMCHS).

The CMCHS concept, a contingency planning effort, is designed to provide the Federal health care system with augmented hospital and medical capability. During a declared national emergency or state of war, should the number of military casualties suffered in a conventional, overseas conflict exceed the Department of Defense and Veterans Administration medical capabilities, the system could be activated.

Defining the configuration and linking system for hospitals was a central issue in the development of the system. *Recognizing that a military casualty in a civilian hospital presents unusual health care and administrative situations, a system was designed so that civilian hospitals in a specified geographic area are voluntarily linked to a designated military hospital.* These military hospitals, working in cooperation with the civilian medical community, will develop local plans, implement education and training programs, conduct exercises of the system and, if the system is activated in a wartime situation, coordinate the care of

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military casualties. The selection of participating civilian hospitals is based on analysis of each hospital's capabilities and considers the following factors:

- **Available Beds.** Participating hospitals should be operating approximately 150 beds and be willing to commit a minimum of 50 operating beds to the system. Beds which are currently unoccupied and not staffed may be viewed as expansion potential for the system.

- **Proximity to Military Air Base and/or Civilian Jet Airports.** Statistics from previous conflicts and disasters clearly indicate the importance of time in providing care to patients. The greater the

distance and the longer the time to traverse that distance, the greater the chance of medical complications to the patient. More than 800 miles (2 hours) by jet or 50 miles by land transportation from the debarkation point may be excessive for many military patients. Therefore, hospitals throughout the United States which are close to major military air bases or large civilian airports would be ideal participants.

- **Special Services Capability.** Each participating hospital should be able to provide certain basic services, including postoperative recovery room, intensive care, blood bank, respiration therapy, diagnostic x-ray services, laboratory ser-

vices, emergency department, physical therapy, and appropriate support services (food, nursing, supply). Other special services, such as burn therapy, should be available in the geographic area.

- **Available Personnel.** Participating hospitals must have a trained staff available to provide 24-hour coverage for patient care. It is important for the administration of the hospital to develop an understanding of the personnel impact of a full military mobilization.

Since the system is entirely voluntary, the Department of Defense encourages hospitals to consider carefully their ability to meet these requirements and

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make a commitment to the program before a final decision is made. Any decision made to participate in the program should be a joint decision of the hospital's administration, medical staff, and board of trustees.

Hospitals who desire to participate in CMCHS are requested to sign a memorandum of understanding with the Department of Defense. The memorandum sets forth the number of beds the hospital could allocate and provides for billed charge reimbursement to the hospitals and health care providers. A third party payment system is currently under development.

Recently, there has been some misunderstanding regarding the purpose and intent of this program. This misunderstanding has centered around the mistaken notion that the program was designed to support a tactical nuclear war and, as such, is evidence that the United States is preparing to wage such a war. This assumption is erroneous. From its inception in 1975, the CMCHS was designed to provide a response to the medical needs of casualties arising from a conventional conflict and casualty estimates are based on wartime scenarios involving conventional weapons. If one were to examine the past history of conventional warfare, it would be noted that during the peak months of World War II there were over 400,000 military casualties using medical facilities within the United States alone. In more recent times the number of military beds supporting the Vietnam conflict was over 50,000.

Today, military hospitals in the United States operate approximately 18,000 beds. In the event of a full-scale military mobilization, the majority of the military physicians, nurses, and medical techni-

cians now staffing military medical facilities in the United States would be reassigned to combat hospitals overseas. This would create a serious gap in our capability to provide medical care for casualties returned to the United States for further medical treatment.

The CMCHS has received the endorsement of the American Hospital Association, the American Medical Association, the American Osteopathic Association, and the American Osteopathic Hospital Association. The Department of Defense will be working closely with these associations as well as other important groups including the Department of Health and Human Services, the Veterans Administration, Federal Emergency Management Agency, and national, state, and local health associations and provider groups.

One interesting aspect of the program is its possible use in peacetime during a natural disaster. Today, many states and communities have developed medical plans for responding to a natural disaster, but at present there is no such plan on the national level. Should a situation arise that would require a national medical disaster plan, CMCHS could respond with coordinated medical support. Representatives of the Department of Defense are currently working with other Federal medical planners on this possibility.

The main objective of the Civilian-Military Contingency Hospital System is to develop an effective system of military casualty care in the United States utilizing civilian hospitals and their existing delivery capabilities. The CMCHS plan has been designed as the most cost-efficient contingency program to provide needed medical support during a military emergency. It is hoped that the system

will never have to be used; however, it is a vital part of our overall medical preparedness.

Over the past year the program has been attacked by some professional societies who claim that to participate in the program is to aid in the preparation for nuclear war. This is not true and was not the basis for developing this cost-effective emergency system.

The issues have come before the legislative bodies of several professional societies for debate and official resolution. At the American Medical Association meeting in December 1981, the resident and student section attempted to pass nonsupportive resolutions in both reference committees and the House of Delegates.

We must be supportive and well informed as to the background of CMCHS and its benefits to Americans. We should attempt to inform the misinformed and suspicious so as to insure that every service man and woman receives the medical care he or she deserves.

To refuse participation in such a valid program on the basis that it is supporting nuclear war is the same as assuming that closing emergency services in hospitals will stop acts of violence or do away with crime.

Learn the CMCHS program. Be articulate, knowledgeable, and positive in your professional associations. Protect them from making poor decisions based upon incorrect information. □



Hypothermia

CDR Donald C. Arthur, MC, USN

Clinical Presentation

Part three in a series

The clinical presentation may be divided conveniently into the subjective and the objective findings. Subjective findings refer to the symptomatology—what the patient feels and describes. Objective findings (signs) refer to those phenomena observed by the examiner.

The following presentation of these signs and symptoms, as correlated with core temperature, is intended only as a guide. One must be aware that there is tremendous variability in individual responses. The variables, alluded to previously, of nutrition, conditioning, body fat content, and habitus, etc., as well as the basic individual variations in body constitution (differing basal metabolic rates, for example), will afford more or less of a functional decrement to one individual at a core temperature which would result in a different response for another. It is unknown, for example, why ventricular fibrillation would intervene in some victims as their terminal event at around 77°F, yet not occur for others who expire of gradual cardiac standstill at a much lower core temperature. The rule is to guide therapy by the clinical presen-

tation of the patient, not by the core temperature alone.

Subjective Findings

The onset of hypothermia is much like that of falling asleep; one doesn't realize when he slips from consciousness into the sleep state unless he thinks about it. One must also be thinking about hypothermia to recognize it. With continuous exposure, the effects of hypothermia are insidious and eventually reach a point when, as all the body's emergency heat production and conservation measures have failed, the course is precipitously downhill.

The only subjective effects of gradual core cooling are concerned with the central nervous system and the local effects of cold on muscle strength and efficiency. The victim will naturally "feel cold." The first subjective effects will be decreased dexterity and coordination due to local effects of cold on extremity muscles. One will almost immediately notice manual functioning becoming slowed and coordination diminishing; he will become clumsy and inefficient. Nerve conduction is also decreased, contributing to loss of dexterity and sensation. There is also diminished proprioception (feeling of position and angle of joints).

These effects occur as the extremities are cooled, yet the core tempera-

ture has not yet begun to decline. As core temperature begins to drop, the hypothalamus begins to activate the heat production and conservation mechanisms. One of the first methods of heat production is to increase skeletal muscle tone, thereby increasing its metabolic rate. All skeletal muscles are affected and, as the temperature continues to decline, the increased tone becomes shivering, which can be violent. Shivering begins at about 97°F and is maximal at around a 95°F core temperature. One result of the increased tone is bilateral temporal headaches due to the contraction of the temporalis muscles. The local effects of cold on extremity muscles is compounded by the heat conservation mechanism of vasoconstriction. This diminishes blood supply and, as shivering is established, the tissues become anoxic, accumulating lactic acid and thereby further diminishing muscle efficiency.

The victim usually remains conscious and oriented at core temperatures as low as 92°F. Below this temperature is generally considered severe hypothermia and diminished cerebral functioning becomes increasingly evident. The victim's consciousness begins to cloud and orientation fades. Muscle rigidity is constantly increasing making voluntary motion difficult. Consciousness

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declines as stupor and coma eventually intervene at core temperature below 85°F. One must be thinking of hypothermia to recognize it. Obvious symptoms of severe hypothermia will be preceded by the subtle symptoms of increasing muscle tone, clouded sensorium, and diminished coordination. It should be these softer manifestations of which one should be suspicious.

Objective Findings

The objective findings of hypothermia are not as subtle as are the subjective. After hypothermia is suspected by the manifestation of the softer evidence discussed above, a complete physical examination is essential to diagnose and assess it. Determination of the core temperature is very important. Oral and axillary temperatures are unsatisfactory since they are too peripheral, not close enough to the vital organs. Rectal and esophageal temperatures are the best methods. Rectal temperatures very closely approximate the core temperature owing to the rich blood supply of the area. Esophageal temperature is the best since it measures the core temperature closest to the heart and lungs. This is, however, not practical with the facilities normally available to the corpsman in the field. Special thermometers must be used which record temperatures lower than the 94°F of the usual clinical thermometer. A systematic approach to the physical examination should be the routine and the following discussion will be presented systematically as the core temperature declines.

The earliest signs of hypothermia are, by no means, pathognomonic. The cool extremities with a barely palpable pulse and increased muscle tone will be found in anyone exposed to significant cold. It is the combination of the above subjective findings and the objective findings that will make the diagnosis apparent. One would see cool, dry extremities lacking coordination and strength;

gait is affected, speech is slowed, and there is mental clouding. Patients are, however, usually conscious and responsive with a normal blood pressure until their core temperature reaches 92°F (the level of clinically severe hypothermia) and should be shivering initially.

As the core temperature declines to between 92°F and 85°F, one's consciousness becomes increasingly dulled, coordination increasingly faulty, speech more slurred. Closer to 85°F, the level of consciousness is markedly affected resulting in stupor. The pupils dilate but remain reactive to light. Respirations are diminished but are still regular and spontaneous. Pulse, although difficult to obtain due to the peripheral vasoconstriction, is slowed yet also remains regular. Gastric motility is absent. By this time, shivering has ceased and muscle rigidity remains, thereby dramatically decreasing voluntary motion.

Between 85°F and 80°F, the victim is seldom conscious but should be arousable. Respirations and pulse are further slowed. Myocardial irritability is at its greatest near 80°F with arrhythmias and fibrillation resulting from very slight irritation. Fibrillation is often the terminal event in this temperature range. At 80°F, consciousness is lost, there is no motion, reflexes are absent (including deep tendon and the pupillary light reflexes). Pulse, respiratory rate, and blood pressure are unobtainable. In short, the victim appears to be dead. However, do not lose hope at this point. The victim's vital tissues may be protected by the decreased metabolic rate and the low oxygen requirement resulting from the compensatory mechanisms of hypothermia. He must be warmed to assess his condition. The cardinal rule of hypothermia is that *one is not dead until he is warm and dead!*

Below a core temperature of 80°F, most vital functions are at the lowest level compatible with life. Further deterioration in respiratory or cardio-

vascular function will often result in permanent damage. Ventricular fibrillation often occurs spontaneously. Respiration is depressed until all breathing stops. Damage to lung tissue by direct effects of cold results in pulmonary edema further hindering gas exchange and making the resuscitation efforts more difficult. Around 70°F the heart will slowly stop spontaneously if fibrillation has not intervened as the terminal event. It is important to note that even if the victim is conscious, cardiac irregularities can be present and irritability increased. Indeed, nonpathologic irregularities occur in the healthy normothermic individual.

The diving corpsman will seldom see the advanced signs of hypothermia. Instead, the subtle initial signs will be the only clues. The hypothermia which will occur in normal Navy diving operations will only be of the mild type evidenced by deficits in mentation and dexterity. The more severe hypothermia victims will be seen as the result of accidents: the drunk on a park bench in January, the widow living alone in an unheated flat, the child who doesn't reach the other side of the thin ice, or the mountaineer who is caught unprepared for a chilling spring storm. Prevention is the answer; treatment is only second best.

First Aid and General Management

The time-honored cardinal rules of first aid should be observed in the treatment of hypothermia as well. First, there is usually no great rush since the progression of hypothermia is slow and the victim's fate will usually not be greatly altered from one second to the next unless cardiac standstill has intervened. Indeed, if one were overly zealous in his first aid, ventricular fibrillation could be triggered by the well-meaning first aider. Recall the increasing myocardial irritability.

The ABCs of standard first aid apply: insure an established airway, support adequate breathing, and

maintain circulation. If cardiac standstill has occurred, cardiopulmonary resuscitation (CPR) should be initiated with chest compressions at one-half the normal rate if the core temperature is below 92°F. The secondary principles of first aid should then apply while carefully moving the victim from the environment and beginning the rewarming procedure. These secondary principles involve treatment of bleeding, stabilizing of fractures, etc. Keep in mind that sophisticated hospital treatment will be necessary for any victim whose core temperature is less than 92°F and that it will not be the responsibility of the corpsman to manage totally the hypothermic victim.

Treatment modes will depend on the victim's degree of hypothermia. A mildly hypothermic patient is one whose core temperature is greater than 94°F and who is conscious and shivering. These patients will have retained the ability to rewarm themselves if removed from the environment. They are in no serious danger and will not require hospitalization. Their treatment will consist of simple rewarming methods and supportive care. These are the patients who the corpsman will usually be seeing since the mental and physical functional decrements will be noticed before serious hypothermia is encountered. Proper supervision will result in suspicion concerning diminished performance and subsequent removal from the offending environment. The mildly hypothermic victim should remain out of the cooling environment until *completely* rewarmed.

Depending on the available facilities, the victim of severe hypothermia should be removed from the cooling environment, monitored with an EKG and core thermometer, hydrated with warmed intravenous fluids, given a glucose infusion to compensate for the hypoglycemia, and core rewarming should be initiated. As alluded to previously, the cardiac arrhythmias associated with hypothermia are un-

Signs of Hypothermia as Approximately Related to Core Temperature		
°C	°F	
37.6	99.6	Normal Rectal Temperature
37	98.6	Normal Oral Temperature
36	96.8	Metabolic Rate Increases—Trying to overcome heat losses
35	95.0	Shivering Maximum
34	93.2	Victim still conscious with normal blood pressure
33	91.4	Severe Hypothermia Below This Level
32	89.6	Consciousness becomes clouded, pupils dilate but remain reactive to light, blood pressure becomes difficult to obtain.
31	87.8	
30	86.0	Progressive loss of consciousness, muscular rigidity increased, pulse and blood pressure very difficult to obtain.
29	85.2	
28	82.4	Ventricular fibrillation may develop if heart irritated, cardiac arrhythmias develop, atrial fibrillation occurs spontaneously.
27	80.6	
26	78.8	Victim seldom conscious
25	77.0	Ventricular fibrillation may occur spontaneously
24	75.2	Pulmonary edema develops
23	73.4	
22	71.6	Maximum risk of ventricular fibrillation
21	69.8	
20	68.0	
19	66.2	
18	64.4	Cardiac Standstill
17	62.6	
16	60.8	Flat-line Electroencephalogram (EEG)
15	59.0	Lowest accidental hypothermia victim to recover
9	48.2	Lowest artificially cooled hypothermia patient to recover

responsive to pharmacologic treatment and may be converted to more serious arrhythmias with the intervention of countershock therapy or attempts at defibrillation. Therefore, drug therapy and countershock or defibrillation should be reserved until the core temperature is elevated above 90°F. Adequate circulation can be maintained with proper cardiopul-

monary resuscitation techniques even while the heart is in fibrillation.

The severely hypothermic patient will obviously require advanced medical attention beyond the capabilities of a small dispensary. He will require a medical center and the attention of physicians with specific knowledge regarding the special aspects of hypothermia treatment.

Hence, the above short summary of treatment of severe hypothermia was not intended as a guide to therapy, but only as an overview of the general principles of initial management of severe hypothermia. In actual treatment, all the previously discussed effects of the cold must be considered and treated by medical personnel.

One's thoughts should first be directed toward basic maintenance of body functions through observation of the ABCs of first aid. Secondly, attention should be focused on rewarming the victim.

Rewarming Methods

There has been a great deal of discussion in the scientific literature regarding the proper method of rewarming. Two general categories have emerged, central rewarming and whole body rewarming. Which ever mode is selected, the general rules of hypothermia treatment should be observed:

1. Rewarm the victim only when it can be done properly.
2. Handle the victim carefully.
3. Prevent further heat loss.
4. Do not rewarm too quickly.
5. Rewarm the core first.

Generally speaking, the dividing line between these two categories of therapy should center around the physical findings as an indicator of the severity of hypothermia. If the victim is still conscious and shivering, then one can be safe in assuming that he is only mildly hypothermic and can be rewarmed by any of the whole body methods. He will not be severely acidotic nor prone to myocardial irregularities. Additionally, the body will have retained its ability to rewarm itself if removed from the cooling environment.

Whole body rewarming methods include the following:

- Removal of the victim from the offending environment.

- Application of blankets and other warming and insulating materials.

- Application of moderate external heat to the entire body with a warm shower or by sitting in front of a stove and also placing warm packs on the "pressure points" in an attempt to warm the blood directly.

- Ingestion of warm fluids such as hot chocolate (caffeinated beverages should be avoided due to their vasoconstrictive effects).

- Huddling one sparsely-clothed body with another can be used with only limited success but is better than nothing.

Application of any of these methods will see immediate improvement in the symptomatology of mild hypothermia. The state of consciousness will improve, shivering will abate, dexterity will improve, and sweating will present as the end point of rewarming.

In contrast, the severely hypothermic victim would be made precipitously worse by these methods. As mentioned earlier, the peripheral vasoconstriction and increased muscular activity of shivering results in peripheral chilling to a greater degree than that of the core and high levels of lactic acid accumulate as the muscles contract anaerobically. Consequently, if the periphery were rewarmed before the core, there would be a sudden and massive influx of lactic acid and cold blood. This would worsen the already present metabolic acidosis and would further drop the core temperature as the cold blood mixed with the warmer core blood. This drop in core temperature is called the *afterdrop*. Afterdrop can be fatal as it lowers the core temperature to a more dangerous level than before and by insulting the already irritable myocardium with a bolus of cold blood. The rule in hypothermia (where consciousness is severely blunted and shivering has abated) is to rewarm the core actively and allow the periphery to rewarm passively at its own rate. In this

manner only small amounts of cold, acidotic blood will leak into the core at a time and can be more readily managed by the heart, lungs, and liver which metabolizes the lactic acid. Liver function will, hopefully, already be returning to near normal by the core rewarming methods before the periphery begins to warm.

In contrast to the whole body rewarming methods which are readily accomplished with little expertise, only the first two methods of core rewarming are easily performed outside the hospital environment. These should be initiated in the severely hypothermic victim while transport to a hospital is arranged. Remember, severe hypothermia requires hospitalization to treat the related problems adequately.

In principle, core rewarming is intended to:

- minimize the time the victim is hypothermic;
- quickly revitalize the weakened and irritable myocardium; and
- avert the afterdrop phenomenon by overwhelming the temperature gradients within the victim's body with a massive infusion of heat applied to the core.

A rule of thumb in core rewarming is that a rate of 1°F per hour rise in core temperature is about optimum. Although some controversy exists, this is the most widely accepted rate and seems to be the maximum rate at which a good clinical result is obtained with the least probability of complications from too rapid rewarming.

One of the best methods of core rewarming is immersion of the trunk only in a hot water bath. The water should be about 105°F; a few degrees hotter would result in damage to the skin already susceptible to injury from being traumatized by the effects of hypothermia. This method has been shown to be one of the best because it allows for core rewarming while excluding the extremities, leav-

Summary of Hypothermia Treatment Modalities

Mild Hypothermia

1. Remove the victim from the chilling environment.
2. Apply blankets and other external warming and insulating materials.
3. Apply external heat in the form of warm showers, radiant heat, hot packs to "pressure points."
4. Ingestion of warm fluids, avoiding caffeine.
5. Huddle if no other means is available.

Severe Hypothermia

	<i>Advantages</i>	<i>Contraindications</i>	<i>Disadvantages</i>
1. Trunk Immersion	Readily available Excellent result Allows preferential core rewarming	Trauma with open wounds CPR necessary	Chest inaccessible for CPR Difficult to monitor heart and lungs Must have large basin or tub
2. Inhalation	Leaves chest available for CPR Very effective Selective rewarming of heart and lungs Curtails respiratory heat loss Can be combined with #1 Simple equipment which is inexpensive, easy to transport, and requires no external power	Severe trauma to the face (although tracheotomy or intubation can be performed)	Patient must have spontaneous respiration (although tracheotomy or intubation can be performed)
3. Peritoneal Irrigation	Preferential core rewarming Simple and safe in trained hands Allows dialysis of toxins and metabolic wastes Does not interfere with concurrent treatments Can be used with #2	Severe abdominal trauma	Requires some expertise and laboratory facilities
4. Gastric and Colonic Balloons	Simple and easy to use No special irrigant needed	Severe abdominal trauma	Balloons seldom available Balloon surface area small Balloon may break
5. Colonic Enema	Simple and easy Electrolyte corrections can be made	Severe abdominal trauma	Cannot monitor rectal temperature Does not warm the heart and lungs well
6. Extracorporeal Circulation	Warms blood very effectively Excellent control of rewarming rate	Any trauma or other factor which would obviate the use of anticoagulants	Requires highly skilled personnel and very sophisticated and expensive equipment
7. Diathermy	Warms deeply	Many	Great risk of tissue damage

ing the head and extremities free for inhalation and intravenous therapies to be initiated concomitantly. It is also easy and inexpensive. The only contraindications are trauma involving open wounds to the abdomen or chest requiring chest tubes and, of course, if CPR is indicated. Disadvantages are the inaccessibility of the chest for CPR, difficulty monitoring the heart and lungs under water, and it can be very awkward if a suitable basin is unavailable. Core temperatures should be monitored frequently with a remote probe if possible to obviate the need to constantly manipulate the patient.

The second method is by inhalation of warmed, moist air or oxygen. Early efforts in this area were made using hospital anesthesia equipment and hot water baths afterward to heat the oxygen. Now a small inhalation apparatus is available which can be carried into the field. It moistens and warms oxygen to an optimum temperature of 110-112°F. The advantages of inhalation therapy are that it allows for selective warming of the heart and lungs; the equipment is simple, inexpensive, easy to operate and transport; and requires no external power source. A contraindication is severe trauma to the face, although this can be circumvented by performing a tracheotomy or by intubation. A disadvantage is that the patient must have spontaneous respirations, although this, too, can be remedied by tracheotomy or intubation. As before, adequate monitoring is required. The inhalation method has been shown to be about as effective as trunk immersion, requiring only the equipment and a little training in its use.

Peritoneal irrigation is a hospital procedure which involves placing a catheter into the peritoneal cavity and instilling warm (to about 105°F) fluids. It is very similar to peritoneal dialysis which uses the large surface area of the peritoneal cavity for removing waste products from the blood like an artificial kidney. This

large surface area provides an opportunity for rapid core rewarming as well. Advantages are that, in trained hands, the procedure is simple and safe, it applies heat centrally, allows for dialysis of a toxin or drug which might be present in the victim's circulation, allows for correction of electrolyte imbalances when the proper irrigation fluids are utilized, does not interfere with concurrent treatment, and can be used in conjunction with inhalation rewarming methods. A contraindication is severe trauma to the abdomen. Under this circumstance, warm irrigation during surgery would substitute. Its disadvantages are the expertise required to perform the procedure and the requirement for laboratory facilities for careful monitoring of the electrolytes.

The above three methods are the most practical and widely used core rewarming methods. The following are mentioned for the interest of the reader.

Gastric and colonic balloons have been utilized by circulating warm solutions through them. Their advantages are their simplicity and ease of operation. No particular expertise is required and there are a number of irrigant solutions that can be used. However, balloons are seldom available, their surfaces are smooth and, therefore, do not affect nearly as large a surface area as the latter three methods. If the balloons break their contents can spill into the respective body cavities, potentially creating osmotic or electrolyte imbalances if absorbed. Lastly, the area of the heart and lungs is only secondarily warmed.

Colonic enemas have been employed with success. Their advantages are the ease and simplicity of instilling a warmed enema and that electrolyte imbalances can be partially corrected with proper selection of the fluid to be instilled. Disadvantages are that it does not allow rectal temperature monitoring, does not allow direct warming of the heart and

lungs, and once the enema is instilled, recovery may be difficult if complications should arise requiring its evacuation.

Extracorporeal blood rewarming is a very effective method but requires very sophisticated equipment and a specially trained team of surgeons and technicians available only at the most advanced hospital centers. It also requires the use of anticoagulants which might be contraindicated in the presence of trauma.

Diathermy, or microwave therapy, is sometimes used to heat the core preferentially. Diathermy is mainly used in the treatment of muscle spasm because of its deep heating action. It is, however, fraught with hazards in the treatment of hypothermia and is mentioned here only in passing.

In summary, the principles of hypothermia treatment are simple. First, remember the ABCs of first aid: insure an established airway, support adequate breathing, and maintain circulation. If CPR is required, perform it at one-half the normal rate if the core temperature is below 92°F. Secondly, treat active bleeding, stabilize fractures, and treat life-threatening trauma. Third, determine the level of hypothermia. Next, keep the victim hydrated and give glucose if it's available. Monitor with an EKG and rectal thermometer if possible in severe hypothermia. After assessing the severity of hypothermia, select an appropriate rewarming method and obtain sophisticated medical assistance if necessary.

Remember—be gentle! The cooled myocardium is prone to fibrillation if insulted. Recall that drugs have no place in early resuscitation efforts since they have no effect on the hypothermic heart and would only accumulate to have their effects manifest later when they might not be desired.

(Because of space limitation, the concluding installment of Hypothermia will appear in the June issue.)

The Adolescent in the Armed Services: A Bridge to Vocational Resolution

CDR Eli Breger, MC, USNR

The attainment of vocational direction and commitment is a major development task of adolescence. Success reflects resolutions of issues involving personality development, acceptance of a work ethic, acquisition of effective work habits, and searching for a personally meaningful area of work. A significant number of youths struggle ineffectively, become mired in conflict and failure, and then drop the quest. Others accept resolutions which fall far short of potential leading to a work life of quiet desperation.

For selective adolescents the armed services, under voluntary, peacetime conditions, provide a useful moratorium. It can help to avoid an impulsive or non-productive vocational decision. It can offer an opportunity for working through unresolved problems negatively affecting work, and it can provide a setting for the development of useful and remunerative skills.

As naval officers we work closely with young enlisted persons and are largely dependent on them for the efficient and responsible carrying out of a multitude of tasks and duties. They in turn rely on us for leadership, supervision, support, and understanding. It stands to reason that the more we understand the psychologic issues relating to an individual's ability to work, the more intelligently and skillfully we can serve our sailors' and waves' development, promote retention, and enhance the success of our mission.

Developmental Aspects Determining Ability to Work

The passage from infancy through school age and into work has long been recognized as a complex process influenced by a multitude of factors. Parents attempt to influence positively this process during their child's development. Professionals working with young people have attempted to unravel the transitions' mysteries to facilitate a smooth and successful passage. Vocational guidance specialists recognize that knowledge of an individual's background, personality, and interests are more effective predictors for a successful work choice than are aptitude tests.⁽¹³⁾ To predict a successful ability to work, considerations of self-concept, ego

strength, and identifications are essential. Significant contributions also come from an individual's social and environmental history.

Although in each individual the composite of contributing factors is unique, it is reasonable to assume that certain transitional developmental lines can be traced from early childhood through adolescence and into adulthood which have significant universal bearing on vocational behavior.⁽¹¹⁾ Along the way essential interactions occur between intrapsychic phenomena and environmental influences resulting in a myriad of durable consolidations. Some of these influences are on a personal and family dynamic level and others on a wider societal plane, i.e., economic opportunity, quality of education, sex, and race discrimination. One must add to this equation issues of innate temperament, intelligence, and talents.

Psychoanalytic theory has viewed work as reflecting a displacement of psychic energy from instinctual drives. Freud⁽⁶⁾ wrote:

No other technique for the conduct of life attaches the individual so firmly to reality as laying emphasis on work; for his work at least gives him a secure place in a portion of reality, in the human community. The possibility it offers of displacing a large amount of libidinal components, whether narcissistic, aggressive or even erotic, on to professional work and on to human relations connected with it lends it a value by no means second to what it enjoys as something indispensable to the preservation and justification of existence in society.

An alternative concept holds that energy for school and work is not displaced but rather is a semiautonomous function which can be called a "drive for mastery." This independent urge manifests itself initially in pleasures associated with unfolding motility, accelerates during latency, and broadens with pleasures gained from mastery of various skills.

The development of a "work ethic" and "work personality" is dependent on all stages of development with some appearing more critical. During infancy a secure mother-child relationship allows the infant to move beyond total narcissistic self-investment to a sense of self-reflecting parental attitudes. This awareness of mother as separate then allows for endowing her with love, which in time extends to other key individuals in the environment. By doing so the path opens for identification and emulation of significant figures and their values. The

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mechanism is hereby established for eventual identifications with teachers, and energy is set free for school-based cognitive development.

Latency (elementary school years) is a key timeframe for this line of development. We see a shift from energy invested in fantasy pertaining to nuclear family toward realistic achievement and mastery in the larger world. School becomes the child's first work, and homework further stressfully harnesses the pleasure principle and directs it toward the reality principle. Work has entered the arena of play. The emergence of "work styles" (7) is first noted and later refined into such categories as realistic, intellectual, artistic, conventional, enterprising, etc. When a young schoolchild is asked what work he wishes to do when grown, his responses during this "fantasy stage" reflect psychodynamic issues such as seeking identifications but are not related to his refined interests and abilities. Erikson (4) focused on this stage as one in which the potential for feelings of inferiority is significant. During this stage of "industry vs. inferiority" Erikson views the schoolchild as seeking recognition by perseverance and diligence, preparing for a future outside the family, and gearing up "tools" for a future productive existence. The developing ego now includes work within its boundaries. When children view their abilities as deficient compared to older or more accomplished students, feelings of inadequacy and inferiority may emerge having serious implications on future work. The child may avoid the challenge or accept his lot as doomed to drudgery and mediocrity.

Adolescence witnesses a consolidation of study habits, an increase in task orientation, and a goal direction. A middle adolescent will consider his abilities and interests when contemplating future work. This "tentative stage" is characterized by frequent shifts and is influenced by such values as job status. A "realistic stage" is entered when the late adolescent deals with vocation choice by assessing his abilities as well as environmental opportunities. This should culminate in a crystallization of choice which is then pursued with initiative and curiosity. Accepting a job will be seen as an adventure symbolizing emancipation and a new adult status. This further strengthens the ego's sense of industry and adds to prestige. Erikson (5) highlighted this positive impact of an occupation on ego by stating that through identification with a vocation "one becomes what one does."

Inherent in the search for identity is the need to choose one's future occupation. Identity diffusion, a major problem of adolescence, seriously hinders work and study potential. Its roots are in the developmental issues discussed as well as in societal factors. Many young people do not acquire the work ethic and identify with individuals who have failed. They back off into non-challenging work or fringe groups not working at all. Their opposition to work represents a rationalization for

developmental defects which resulted in their lack of capacity for work. The role of parental work models is also important. Productive individuals usually had parent(s) who worked successfully. The traditional middle class work ethic was seriously challenged in the 1960s by youth who activated latent romantic and humanistic notions and viewed working for money as dehumanizing and empty affluence. Increasing specialization creates an indistinct, vague vocational reality and complicates vocational resolution. The prolongation of education adds to the complexity by making school a vocation in itself rather than a preparation for work.

Reasons Young People Enlist

Healthy and Rational Reasons

- Some young people desire a moratorium. They do not feel ready to make a permanent work commitment, are not desirous or ready to continue education, and/or desire an opportunity to mature in a conservative, structured setting of which parents approve. Should a useful skill be learned, so much the better, but it is not primary.
- Some seek the "rite of passage" into adulthood. Many emotionally healthy adolescents see in the process of recruit training or boot camp a second opportunity for socialization which will finally enable them to pass beyond childhood. They may express this directly or describe it in terms of seeking adventure or a lifestyle with a clearly delineated path with achievement through the ranks.
- Some view the vocational opportunities as attractive. They perceive many short-term occupational specialty schools as appealing. Many seek financial benefits for eventual return to college.
- Some identify with their parents' chosen profession, are familiar with the military, or other positive considerations. Nonmilitary children may have internalized within their ego ideals a heroic and positive conception of military life.

Decisions Motivated by Developmental Problems Affecting the Work Personality

In the main these adolescents are not overtly disturbed but have disorders of character and personality. Consciously or unconsciously they seek to rework the defects, thereby strengthening their sense of self and their coping skills.

- Some enlist to please parents. These youths have experienced much failure, have not afforded their parents much pleasure, and in turn have perceived rejection. Conflict with parents results in internal superego-ego conflicts. By making their parents proud

they hope they will be loved and, in turn, develop self-love. This adolescent struggle is seen even where parents are not available. Young persons may enlist to please recruiters in whom they imbue parental feelings. Such relationships develop when recruiters visit high schools and work with selective prospects for many months. A youth might choose a military career to please parents even if the idea did not originate with the parents. The adolescent's ego ideal includes patriotism, heroism, and uniforms, and as such he feels certain he will please his parents as well.

- Some become part of the military to help distance themselves from their nuclear family and attain autonomy in a setting they anticipate will be structured, supportive, and protective. Many youths struggling to separate from family observe previously supportive peer groups scattering, with some entering service. This may lead to an enlistment through peer identification or to find a new fraternity of friends. Where home life has been destructive they seek to create a benevolent "military family" with officers and fellow enlistees replacing parents and siblings. Infrequently in today's military do enlistees seriously consider the essential military mission—preparedness and combat.

- Many join seeking structure, discipline, and work habits in the military life. Many young people will acknowledge their deep sense of inferiority, deficient personality tools, lack of commitment to work, and wish to erase these weaknesses. They inherently know that to succeed they first have to get up in the morning. They have learned this by sensing their inability to seek work or lack of staying power on a job. They seek an authoritarian structure away from home to help them. Some who feel adrift without any semblance of vocational calling view the military life in the more global sense of "I am what I do"; therefore, by simply enlisting they attain a vocation.

- Some seek resolution of sexual identity problems. Such problems may range from needing sexual experience and experimentation away from the confines of family and community to a last desperate attempt at undoing a sense of homosexuality. Increasingly, adolescent females are selecting the military as a career in which they constructively sublimate masculine strivings.

Adolescents Who Enlist Without Any Logical Substantive Reason or Out of Clearly Pathologic Considerations

- One sees desperate youths out of school, isolated from family, hungry and cold, who impulsively make a 4-year commitment after noticing a recruiting poster. They thereby settle their precarious predicament of the moment.

- There are those anticipating arrest who seek to "get lost." Others are ordered to join by a well-meaning judge as an alternative to incarceration.

- Frankly disturbed and even psychotic youths seek to resolve their profound life problems and slip by recruiters. At times recruiters are desperate to meet quotas and encourage withholding of information, placing unfair and unworkable burdens on these youths when training begins. Adolescents experiencing "identity diffusion" relating to neurotic or borderline states flee into service hoping to consolidate a sense of self and allay anxiety. Chronically psychotic youths with histories of repeated hospitalization will slip by until cessation of their psychotropic medication leads to a return of bizarre behavior which calls attention to them. Some borderline youths who have experienced repeated failures will join the military as a last, valiant effort before giving up the quest.

Benefits of the Military

Indeed, much can be said in its behalf. Facets of military life are myriad and vary from one branch of service to another, from one occupational specialty to another, and certainly change greatly during wartime. However, the following can be generally stated.

The military offers a moratorium on permanent vocational commitment in a socially approved, generally useful, and ordered environment; it is a secure setting in which to find oneself. Built-in opportunities exist to advance in one's adolescent tasks of separation-individuation, sexual identification, and vocational growth.

Boot camp allows for a rapid, clearly defined, and usually successful "rite of passage" resulting in enhanced confidence.

Enlistment brings an opportunity for adventure. To youths who have had limited exposure and opportunity, the military experience, particularly if successful, adds an exciting dimension which helps ward off dysphoria associated with feelings that life has been humdrum.

For the receptive youth with growth potential, ideal circumstances exist to strengthen the work personality.

- Assignment to a school or occupation occurs immediately after graduation from initial training. Vocational life is then highly structured as to hours at work, job responsibilities, additional duties, pay, dress code, schedule of rank advancement, and disciplinary action.

- Fitness reports are submitted regularly by supervising personnel and advancement is largely dependent on them.

- A service record is established which, for youths with troubled and checkered backgrounds, symbolically represents a clean slate offering the chance to start anew.

- Supervising personnel and commanding officers are responsible for the development of new enlistees and, contrary to a stereotype, do make repeated attempts at counseling, supporting, and enhancing development of responsibility.
- Discipline, when dispensed, is rarely severe or excessive unless the violation is serious or repetitive.
- One's job is not lost readily. In contrast to civilian life, the enlistee is repeatedly counseled about his deficiencies and at times work adjustments made in his behalf.
- The serviceman who wishes discharge due to inherent personality problems with commitment or realistic job dissatisfaction, does not succeed quickly and therefore may develop more staying power.

For those seeking skill development, opportunities are there with relative assurance of utilizing that ability once developed. Schools exist for virtually all vocations and vary in length from several weeks to a year. In the main the programs are brief and allow for rapid attainment, thereby encouraging feelings of success and vocational identity unique for many with histories of repeated failures. By and large the skills have their greatest value in the context of developing a work ethic and identity. Selective skills (data processing technician, medical repair specialist) have marketable worth in civilian life.

Although a successful tour does not assure success with the complexities of adult life in the civilian sector, it does strengthen the chance for success in the work aspects of that life.

Success and Failure

The beneficial impact of a military experience usually takes hold after completion of a 2- to 4-year tour of duty. In spite of intensive psychologic research to predict who are at high risk to fail from those seeking enlistment, the answer remains elusive although pointing in expected directions. (1,3,8,9,10,15) The military is vitally interested in this research because of the high costs involved in evaluating, treating, and administratively separating the unsuccessful.

Failures in boot camp or during the initial tour of duty occur more commonly with those:

- very young in age,
- unmarried,
- having histories of antisocial behavior,
- having backgrounds of parental discord,

- having poor relationship with parents,
- having poor peer relationships—loners,
- who enlisted impulsively, and
- who clinically fall into the classification of personality disorders.

In brief, those enlistees having substantial difficulty with age specific tasks continue to have these problems in service. (2,12,14,16)

Success also correlates to factors within the service generally as well as specific issues on job satisfaction, quality of leadership of supervisor and commanding officer, quality of support and organization structure in the work unit and its reflection in esprit de corps, and the availability of psychiatric treatment.

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Memories of a World War II POW Nurse

Emily B. Rudin

In December 1941 LT Mary Rose Harrington, NC, was a staff nurse at U.S. Naval Hospital, Canacao, the Philippines, shortly before the Japanese took Manila. She was captured 2 Jan 1942 and remained a prisoner of war until 1945. LT Harrington, now Mrs. Mary Nelson, met her future husband in the internment camp and married him shortly after their return to the States. An active mother and grandmother, Mrs. Nelson lives in McLean, VA, where she recently shared her reflections about her experiences as a POW in World War II.

USNM: How did you become interested in being a Navy nurse?

Mrs. Nelson: I was working at St. Joseph's Hospital in Sioux City, IA, in 1936. One of my instructors had been a Navy nurse during World War I. She told me it had been the best job she'd ever had. So I got interested in trying to find something. One of the interns at the hospital got some literature from the Navy Bureau of Medicine and Surgery. I wrote in and the first thing I knew, I had myself an appointment. I joined the Nurse Corps in January 1937. First I went to San Diego; in the summer of 1939 I

went to Mare Island; and then in January 1941 I went to the naval hospital at Canacao, near Manila, in the Philippines.

What are your memories of the Japanese bombing of Pearl Harbor?

I remember that night very well. It was gorgeous—the moon was out and it was beautiful. I was on night duty. It was around 12:30 or 1:00 a.m. I had just come out of the main hospital building on the compound. I passed the cottages looking out on Manila Bay where the officers' families had lived. I thought I would just walk outdoors and not go through the administration building, because it was so nice. As I walked, I heard conversations and I wondered what people were doing up at that hour. Then I noticed an overhead light on in another building. It was the war plans officer's cottage. I thought, "What in the world is he doing?" Apparently, he had gotten frustrated trying to find material and codes using his flashlight, so he had turned on the overhead light. Well, I went on to the large wards, then stood talking to the corpsmen. The night assistant master-at-arms came in and said, "I just got a message that Honolulu has been bombed." I asked, "Did you say 'Honolulu' or 'the Honolulu?'"—there was a heavy cruiser by that name. He said that all he knew was what he told me.

What did you do then?

The next day we cleared the hospital of all the patients we could, because we thought we'd be needing it. We filled sandbags and put them around the buildings, many of which were up off the ground with space underneath. The airfield was bombed that day. A day later the naval station at Cavite was bombed and we got a lot of patients then. We patched them up as best we could.

A lot of help came in—there's an amusing story. There were many "90-day wonders"—young officers just out of training—who had been on torpedo boats and came to us to volunteer their help. One came up and asked me what he could do. I gave him a pair of scissors and said, "Get those patients undressed." Well, I was not very careful: I just said "undressed." I thought that if it was a leg, he'd take off a trouser; if it was an arm, he'd take off a jacket. He went to work and all of a sudden I realized there was something squirming out there. Here were these poor, stark-naked casualties trying to crawl under the bedsheets! I got a corpsman and said, "For God's sake, cover those poor souls!" That fellow knew how to follow orders!

The next day we evacuated all those patients to Sternberg, the Army hospital in Manila. We went there with them and moved in. Then we set up some hospitals in schools

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Mary Nelson recalls her years in the POW camp during World War II: "Up and down, you just went with it."

around Manila, with supplies from the Army and Navy.

Did you stay long at Sternberg?

No. In January 1942 we settled in. Then in March the Japanese sent us to Santo Tomas [a university in Manila that had been converted to a civilian internment camp]. A Japanese officer was in charge of our later transfer to Los Banos. Laura Cobb, our chief nurse, asked him if we should take our beds, and he said yes. Some people didn't want to take any furniture with us, but he said yes, we should, so we took our beds. Bless his heart, we didn't have to sleep on the floor. It was he, not our side, who helped us out on that. He came into camp sometimes, and took letters over to Bilibid for us, because our staff officers were there.

All the POWs from the area were taken to Bilibid Prison in Manila, where they spent their time until some were evacuated to Japan. We could see Bilibid from Santo Tomas. Then the Japanese decided they wanted to get more internees out of town. Up-country, about 50 to 75 miles out of Manila at Los Banos, there was an agricultural college attached to the University of Manila. The Japanese decided to move the internees there, probably for more security. Eight hundred able-bodied men were being sent, and 11 Navy nurses volunteered to go. Missionary and private-practice doctors went too. In Manila there were several missionary hospitals, and all of their doctors were interned with us.

So you volunteered to go to Los Banos?

Yes, we packed up and went there with the 800 men. It was thrilling. They took us by truck and let us take all the baggage we wanted. Laura was determined to take all our health and Navy records. So she stuffed them all inside her blouse. A couple of girls made her some nice leis. So Laura, who was not very chesty anyway, was wearing this whole batch of paper around her waist! She must have roasted, I think, but she had the leis over top of it all.

Ours was the last truck that left for the train station. The public address system at Santo Tomas played "Anchors Aweigh," and I had tears just rolling down. As we were the last ones and they wanted to load, they didn't go through our baggage very carefully. They put us two or three to a boxcar, probably for security. We couldn't open the doors till we got out of Manila. It was hot! They put about 60 men to a boxcar. I had dragged a

big old Filipino hat with me and gave it to one of the guys to use as a wind scoop for a little air. Finally, we arrived at the station in Los Banos and then went about 2 miles to the agricultural station where we were going to be.

A Japanese guard was there with us. The funny thing was, he was thoroughly insulted to have to guard a bunch of women. I think he was really put down, judging from the look on his face. Some of the men got a little worried that they were shipping us off by ourselves with a Japanese guard, so they hopped on the truck. I think he felt a little better when he had a few men to guard.

What was life like in camp?

Once we got settled, we set up the hospital and started working. We had a lot of skin problems from poor sanitary conditions: athlete's foot, jungle rot, and a kind of prickly heat that would get infected. We had bathing facilities but had to share them—it wasn't the easiest.

We Americans set up facilities wherever we wanted them, and organized to get a lot of foot basins and other things made in Los Banos. We had gone there with so few supplies; Santo Tomas wouldn't part with very much. We were given the smallest amount at the new camp, so the men pounded out tin and made us nice little foot basins and all sorts of things for the clinic. We did quite a bit of major surgery there. A supply bus was running back and forth from Manila to bring us whatever was available.

Every able-bodied person was supposed to work an hour or two a day for camp service. That went from picking weevils out of the rice, to fixing vegetables, to working in the



Free at last: Stopping at Guam on the way home, LT Harrington chats with a sailor from her hometown in South Dakota.

hospital or the kitchens, to cleaning—just about anything.

At Los Banos, out in the country, it was very pleasant. There were lots of things with which to occupy yourself. We had entertainment in the evening. We took our folding chairs up on the playing field and some fellows put a public address system out. I really didn't know till not too long ago that sometimes they played radio music. You wondered where the new pieces came from, because heaven knows, we knew all the records they had. And they said, "Oh, somebody brought the new pieces up from Manila." That was always it, somebody always brought it up from someplace. Since the Japanese didn't know we had a radio, we were always afraid that the station would cut in with a news bulletin and broadcast it around the camp.

We put on several plays, and since we had radio shows, we did several plays that way. There was one mike, and everybody worked around it.

One of the nurses had quite a few books; she was a serious reader. So she started a library, both at Santo Tomas and at Los Banos. In addition to people's regular work, they could take classes taught as recreation by professors from various schools.

At certain times, things were pretty easy. At other times, if the Japanese had a defeat someplace, they clamped down for a while. So up and down, you just went with it.

Were letters from home censored?

Yes, they were censored, but they went through, and we got postcards to send a few times. You were allowed 25 words, or something like that. I got letters; some of them came through with hardly anything marked out. I don't know which side the marking came from, of course, because the Americans censored mail too before it was sent out. A Navy friend wrote me a letter. He was so careful in his writing; he said he was still working for the same company, and things like that. Then I saw a

whole paragraph blocked out, and I never figured out any way to find out what was under the marking. Whether the Japanese or the Americans did it, I'll never know.

A few people got shot trying to go through the wires, but on the whole we kept our distance and they kept theirs. Mostly we worked. People kept coming into the camp. First were the 800 able-bodied men. Then their wives and children were permitted to come. Barracks were made, mostly by Filipino laborers. Later, 300 old people came. A barracks was set up as an infirmary for them.

Supplies kept going down and we tried to make it on what we had. They gave us unthreshed rice. Not many people knew how to thresh and winnow it in the air as Filipinos do.

We had a Filipino nurse with us who was married to a Navy man. She was a big help because she could speak the language and knew about the native plants.

What communications did you have with the outside?

There were radios in camp and we had news coming in. There were all kinds of technicians in the camp who could make most anything you wanted. Someone built a radio receiver. He had enough for a transmitter, which he hid under a bed in the hospital complex. The Japanese went easy on the hospital, so guys used to throw things there. It came up to a little canyon and a creekbed, with just one set of barbed wire, so it was easy to slip things over the side and drop it in the canyon. The hospital was kind of a "going" place there.

Anyhow, we heard rumors that the Americans were moving up. It was 1945. A couple of men went out of camp with some guerrillas. One was a State Department man, red-haired and very fair-skinned. They sat down behind the hospital, waiting for dark, ready to slip down what was getting to be a path going out of the camp—I'm surprised the Japanese didn't see

it. Someone said to this man, "Go put long sleeves and long pants on—you're really white and you'll shine in the night!" And so he did. He was quite impressed by his contact with the guerrillas in town and came back with information that events were happening.

A few days before, there was a P-38 bombing of an ammunition dump 2 or 3 miles from camp. Honestly, it felt like the planes were almost overhead. We weren't supposed to watch, but we sure as the dickens did! Every time any planes came over, we were supposed to get out of sight, but we sure watched that show.

The day we were rescued, there was a heavy rumbling before daylight. You could hear and feel it. We got up and got ready; we were supposed to have roll call around 7. We went out there for it and shooting began, so Laura told us to come back in.

I was working in the clinic and I thought, "Oh my gosh, we're going to have casualties in here." So I gathered all the instruments to boil them. Why I didn't leave them alone, who knows? My idea was to get them *more* sterile. But good heavens, the stuff would have made it. As long as it was clean it was good enough. When we did get to use them there was this mess of hot instruments. Oh, the stupid things you do!

We could still hear this rumbling. At one point, we looked out over the balcony, and here was a parachute coming out from a plane going over. I thought, "Oh my gosh, they're dropping supplies and they're missing us." But pretty soon the object straightened up and you could tell it was a man. All balled up, he looked like the supplies. Next, we could hear them coming up the road. Tanks were breaking through the bamboo wall around the area. I thought, "Oh my gosh, Japanese tanks—we'll be right in the crossfire." The guerrillas had encircled the camp, so we were really in a three-pronged attack: the paratroopers were coming up the main



Island-hopping back to the United States in 1945, eight of the newly freed POW nurses crowd around a microphone to read joyous messages to family, friends, and country.

road; the tanks were coming in the other road; and the guerrillas were coming in the back side. There was a lot of action there for a bit.

Anyway, these tanks came in. Later, the soldiers said they had been scared to death, because when they entered the first gate they saw no one and were afraid they might have been too late. But they just kept on coming. You see, we had been moved from the permanent buildings down to the barracks.

Boy, those GIs looked big and fat and nice when they came out of those tanks. Some old gal, a school-teacher's wife, I think, went over and hugged and kissed anyone she could get her hands on. Somebody said, "Hey, have those guys got beriberi, too?" If you had beriberi, in the morning you'd wake up and your face would be nice and full. At night,

when you'd been standing up, your ankles would be puffy from the disease. Anyhow, the humor was still there.

During this attack, we had one girl who was badly hurt. She took a bullet in the abdomen, so she was getting an intravenous. And we dressed a paratrooper's shoulder, and did a few other things in the clinic.

What happened after you left the camp?

We crossed Laguna de Bay in half-tracks and were trucked to the prison at Montinglupa. From there we went to Manila. We went to Leyte in March, then took off from Samar, the big base there, and island-hopped home.

Before we left Leyte, which was sort of a staging area, they gave us some Army uniforms. When we got

to Guam, nobody at first realized who we were; they thought it was another movement of Army nurses. Finally, word got around that we were the Navy nurses who'd just gotten out of internment.

What was it like to be a celebrity?

We were interviewed and photographed. Somebody found out that there were a couple of sailors there from my hometown in South Dakota. One was on duty someplace, and I couldn't get in touch with him, but I did find the other, a poor, nervous kid. He said, "What do I do?" And I said, "Oh, just stand there." We had our pictures taken in front of a relief map of the island, and had interviews, and went island-hopping on the way back—Kwajalein, Johnston, and back to Honolulu.

In Hawaii, we went to Aiea Hospital, which had a dormitory. The girls had just donated all kinds of uniforms—shirts, shoes, underwear, and blues. You just hunted around till you found your size. So we got ourselves in Navy uniforms before we came back.

How was your health?

We had a little run-in with some amoebas, a little dengue, the usual stuff. But on the whole, we did pretty well. We found that people who worked, who did something, were far better off than people who just sat. Watching the real hard times there, I'd say it didn't seem to make much difference what your educational background was. It was something in the person, whether they stood up or not. Some very prominent people did very well, and some just kind of went to pieces. Age didn't make a great deal of difference, either. One young man, a close friend, worked in the clinic too. For some reason, when his belly button was scratching his backbone, he just couldn't seem to accept it. He seemed ready to just lie down and give up. But the people who worked all the time had something on their minds. We did. □

Flight Surgeon Course

CDR Frederic L. Jackson, MC, USN

The Naval Flight Surgeon Course prepares Navy physicians to cope with the unique operational medical requirements of Navy and Marine Corps aviation. Flight surgeons provide acute care, aerospace medical consultative services, occupational and preventive medical care, and medical representation on administrative bodies within the aviation community. They must understand the effects of disease and stress on the active aviator, and must use every medical and administrative skill possible to insure the fitness of the aviation force. The successful flight surgeon is not only a competent practitioner, but a trusted confidant, a knowledgeable flying partner, and a critical observer of squadron life. The ultimate goal is to insure safety in aviation and to preserve very valuable defense assets.

Training

Naval flight surgeon training is conducted at the Naval Aerospace Medical Institute (NAMI), Pensacola, FL. Classes convene annually in March, July, and November. The prerequisites for flight surgeon training are:

- a commission in the Medical Corps,
- completion of a certified GME-1 level training program, and
- physical qualification as a student flight surgeon as prescribed in the Manual of the Medical Department.

The curriculum is 24 weeks long and includes approximately 600 hours

of clinical, didactic, and practical work. Seventeen weeks are spent in general military indoctrination, general operational medicine, occupational and environmental medicine, and aerospace and aviation medicine, particularly ENT, ophthalmology, cardiology, internal medicine, and aviation psychiatry. The course also includes instruction in aircraft accident investigation, survival training, aircrew physical standards, and aviators' equipment. Seven weeks are spent in primary flight training, shoulder-to-shoulder with student naval aviators.

At the completion of the entire training syllabus, the student has the opportunity, based on his abilities and interests, to take a solo flight. Also, the student receives the coveted "Wings-of-Gold" of the naval flight surgeon.

After designation, the flight surgeon may be assigned to any of over 300 billets in the continental United States and abroad. Approximately 20 percent of the billets are associated with carrier air wings, 20 percent are with Marine Corps aviation units, and the other 60 percent are primarily shore-based squadrons and air stations. Overseas assignments span both oceans from Sigonella, Sicily, to Atsugi, Japan. Duty assignments are made on the TRIAD system of detailing with great emphasis placed on personal desire.

After completion of the initial 2-year operational tour, should the flight surgeon be interested in continuing professional involvement with the specialty of aerospace medicine, there is an accredited residency program in aerospace medicine at NAMI. This 3-year program consists of an academic year in an approved

Master of Public Health degree program followed by 2 years in clinical training at NAMI. Prerequisites for entry into the Aerospace Medicine Residency Program are:

- designation as flight surgeon,
- completion of a utilization tour as a flight surgeon, and
- approval by the Program Director at NAMI and by the Surgeon General through the Specialty Advisory Committee.

Applications for the residency must be made via the chain of command to the Commanding Officer, Health Sciences Education and Training Command, Bethesda, MD, in August of the year preceding the desired entry date. Upon completion of the aerospace medicine residency, an individual is eligible to take examinations for certification in aerospace medicine sponsored by the American Board of Preventive Medicine. Graduate aerospace medicine specialists are normally assigned to senior Navy and Marine Corps staff medical billets as senior medical officers on aircraft carriers and air stations, with Marine air wings, and at other major staff commands.

Application procedures and class convening dates for the Naval Flight Surgeon Program may be found respectively in BUMED Instruction 1520.25 and BUMED Notice 1520.

Instructions for applying for the Aerospace Medicine Residency Program are found in BUMEDINST 1520.10H.

Aerospace medicine is a challenging alternative to conventional office- or hospital-based medical practice either for a single tour as a flight surgeon or a career as an aerospace medicine specialist. □

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Complications of Sick Cell Anemia in a Dental Patient

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CAPT George W. Oatis, Jr., DC, USN

CAPT Richard J. Grisius, DC, USN

One of the many complications of sickle cell anemia proved to be life-threatening in the patient presented here; an emergency tracheostomy was required. Diagnostic and treatment considerations are reviewed.

For a clearer understanding of sickle cell anemia and the numerous associated sequelae, the genetics, pathogenesis, and clinical course of the disease are briefly discussed.

Literature Review

Sickling of red blood cells is a molecular abnormality manifested as a homozygous, fatal genetic defect in the synthesis of a type of hemoglobin (HbS). HbS is a variant of the normal adult hemoglobin HbA. (1,2) Sickle cell anemia is an autosomal recessive inheritance and occurs almost exclusively in the black race. (1,3,4,5) The disease occurs in approximately one in every 400 for the homozygous disease state; 10 percent of blacks in the United States are carriers of the trait. (2,6) The heterozygote genotype, AS, which is carried in a

masked state by both parents, produces a sickle cell trait known as sickle trait. (1) For the clinical characteristics of sickle cell anemia to be present, a homozygous state of the trait must exist. (1,7,8,9,10) When both parents have the trait the basic Mendelian genetic pattern is observed: one out of four children will be normal, two will have sickle trait, and one will have true sickle cell anemia.

Under normal conditions the individual with the sickle cell trait will not show signs or symptoms of the disorder. (6) Previously, sickle trait patients were considered to have a mild form of sickle cell anemia; this is incorrect. (11) However, when the hemoglobin S comprises 80 percent of the adult hemoglobin, sickling can occur even at normal oxygen tension. (1,12) When sickling occurs a distortion of the red cell is seen. The crumpled appearance of the erythrocytes resembles a crescent, thus the sickled shape. The red blood cells can also appear elongated and narrow with rounded ends (depranocytes). (1,12,13,14,16)

The sickle cell patient may present with the following clinical signs and symptoms: (1) dehydration, which may be the etiologic factor of a crisis; (2) pain in the joints of the long bones as well as in the associated long bone itself; (3) metacarpal and metatarsal

pain; (4) enlargement of the heart, generally the left side; (5) systolic murmurs; (6) chronic leg ulcerations; (7) periodic bleeding from the nose; (8) jaundiced sclerae; (9) severe lower back and abdominal pain; (10) oral mucosal surfaces which appear pale or jaundiced; (11) idiopathic mandibular pain, usually unilateral; and (12) burning sensation or numbness of the mandible. (2,3,7,13,15,17,18)

True sickle cell anemia is characterized by periods of latency interrupted by periods of acute crisis. (16) Precipitation etiology of a crisis may be: (1) dehydration; (2) acidosis; (3) trauma; (4) overexertion; (5) surgery, including dental extractions; (6) infections; (7) general anesthesia; (8) high altitudes; (9) erythrocytosis and vascular occlusion, which may lead to hypoxia; and (10) pulmonary diseases which decrease the oxygenation of the blood. Either an increase in the red blood cell destruction rate or a decreased red blood cell production rate may lead to an exacerbation. (6)

The clinical course of sickle cell hemoglobinopathies is well documented. However, not all the clinical complications have been recognized. In the following report, several complications of sickle cell latency and crisis as well as the corresponding dental ramifications are presented.

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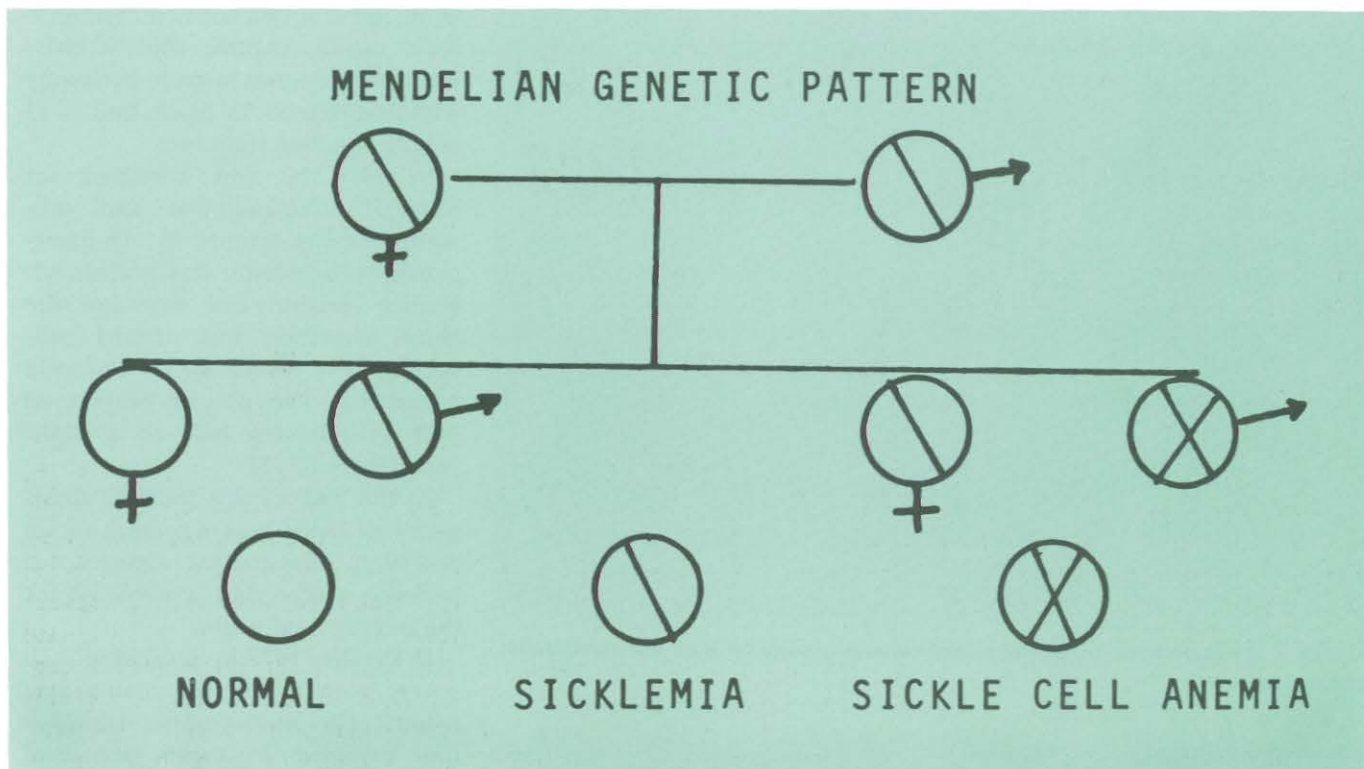


FIGURE 1. Mendelian genetic pattern of the patient's family

Patient report

The patient was a 27-year-old black male in whom the diagnosis of sickle cell anemia was made at 17 months. The first documented crisis occurred at age 19. The family history was significant for sickle cell traits and followed the Mendelian concept perfectly. The patient's parents were both diagnosed for sickle cell anemia. The four progeny demonstrated the following genetic pattern: two children have sickle cell trait, one is normal, and one has true sickle cell anemia (Figure 1).

The patient's past medical history was significant. He had over 60 admissions for sickle cell pain crisis and the complications of sickle cell disease including aseptic necrosis of the shoulders, hips, and knees. He had a history of parotid hypertrophy



FIGURE 2. Patient with life-threatening Ludwig's angina



FIGURE 3. Asymptomatic periapical radiolucencies associated with the mandibular right molars



FIGURE 4a. Maxillary and mandibular intraoral hematomas

and salmonella osteomyelitis. Salmonella osteomyelitis accounts for more than half the cases of osteomyelitis seen in sickle cell anemia. (19) The patient had pneumonia seven times in all, pleural effusions, proteinuria, otitis media, chronic cholelithiasis, burn infection, left heart hypertrophy with first degree AV block, and II/VI systolic ejection murmur.

In 1974 he was admitted for bilateral submandibular and submental edema (Figure 2). An emergency tracheostomy was performed. During incision and drainage the blunt dissection was carried subperiosteally revealing an infected hematoma. The patient progressed well, complaining only of a slight paresthesia. (7,15)

At the time of this medical emergency all 32 teeth were present and in occlusion. The patient reported for periodic scaling and prophylaxis for the next several years.

In October 1977 he presented with severe pain in the left mandibular molar teeth. Radiographic examination revealed advanced periapical abscesses, and under regional anesthesia these teeth were subsequently extracted. An acute crisis followed within 3 hours of the extractions.

In June 1979 the patient presented for a routine examination which revealed asymptomatic periapical radiolucencies associated with the maxillary right first bicuspid and second molar and mandibular right second bicuspid and first and second molar (Figure 3). Vitality tests indicated these teeth to be nonvital. Endodontics was performed revealing aseptic necrosis of all pulpal contents. Several pulpstones were also present.

In October 1979 the patient was admitted for an acute exacerbation and complaints of left mandibular pain. After admission there was an acute onset of left mandibular and maxillary alveolar ridge soft tissue swelling (Figures 4a and 4b). Oral examination revealed the left posterior mandibular alveolar mucosa to

be elevated approximately 2 to 3 cm with a small ulceration on the superior aspect. The hematoma was fluctuant and essentially nontender. The patient was unable to occlude secondary to the mandibular hematoma. The examination also revealed formation of a hematoma beneath the attached gingiva adjacent to the first and second maxillary left molars. The etiology of the formation of these hematomas was unknown. A hematological profile was reported as normal. The hematomas were incised and drained and the patient was placed on antibiotics. Healing of the maxillary hematoma was uncompromised. The mandibular alveolar mucosa sloughed, apparently due to the tissue infarction, leaving approximately a 1.5 cm area of denuded bone on the superior aspect of the ridge (Figure 4c). The area of denuded bone was still present 7 months postinfarction without evidence of sequestration or pain. A brief period of lower lip parasthesia followed.

In December 1979, because of supraeruption, the first and second maxillary left molars were extracted during a quiescent period of the anemia (Figure 5). The oral surgical procedure utilized IV sedation, local anesthesia, IV aqueous penicillin G, and low-flow oxygen. The patient tolerated the procedure well; there were no postoperative complications.

Discussion

A report of sickle cell anemia has been presented with unusual and life-threatening complications. Normally, one would expect aseptic necrosis and infarction to be located in areas which are poorly perfused with blood. With sickling of the red blood cells, the blood flow tends to become sluggish in the smaller vascular channels which supply the periosteum, dental pulp, and gingival tissues. The sequence of events may account for the aseptic necrosis of the pulp tissue and resultant periapical bone destruction associated with the endo-



FIGURE 4b. Mandibular hematoma with small ulceration



FIGURE 4c. Area of denuded mandibular bone on the superior aspect of the left alveolar ridge



FIGURE 5. Panorex showing supra-eruption of the maxillary left second and third molars and periapical radiolucencies of the right mandibular teeth

dontically treated teeth. Stanley and Soni noted that the presence of the denticles in the pulp canals is significant because their formation may be due to the results of thrombosis of pulpal vessels. (9,20)

Regarding the intraoral and submental/submandibular hematomas, a similar hypothesis can be proposed. Due to the decreased oxygen tension and the subsequent sickling and sludging of the red blood cells, a plugging of the vessel lumen may occur, leading to an anoxic area of the vessel endothelium. This area of infarcted endothelial cells may lead to a structural weakening of the vessel which can rupture on its own or when the patient is rehydrated with intravenous fluids. This weakened area may rupture progressing to the hematomas and subsequent complications. Complications with this particular patient were the life-threatening Ludwig's angina and the alveolar mucosal sloughing with resultant denuded mandibular bone.

Treatment

A careful preoperative treatment regimen is of utmost importance in the management of a patient with sickle cell anemia. Hypoxia should be

prevented with a low flow of oxygen, 3 liters/minute, (10) administered via nasal cannula. Dental appointments should be scheduled in the morning and kept short to help minimize a stressful situation. (9) Regional anesthesia is desired over general anesthesia whenever possible to avoid lowering the oxygenation of the blood. (12) To prevent the suppression of central respiratory centers, the use of barbiturates and narcotics should be avoided. (21) Nitrous oxide should be avoided to prevent possible delivery of too little oxygen. Some clinicians recommend transfusing their patients with whole blood to raise the hemoglobin content before extraction of teeth. (6,12,21) Because of the sickle cell anemia patient's decreased resistance (infections are a common postoperative sequelae), a prophylactic coverage of antibiotics is recommended. (21) The patient should be well hydrated before the beginning of any dental procedure. Positioning of the patient, especially for a lengthy procedure, is important. For example, if the patient's arm were allowed to hang over the edge of the surgical table, vessel crimping could result in venous stasis with possible sludging and sickling.

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Toward the Improvement of Weight Loss Programs: An Evaluation Process

LCDR Arnold Mattis, NC, USN

LT Wayne Murphy, MSC, USNR

The standard approach to evaluating a weight loss program is to focus almost entirely on the number of pounds clients lose. Some evaluations also include weight changes occurring during a limited followup period. Though this "end-result" approach to the evaluation of weight programs is important for determining what programs achieve their intended effects, it does not provide administrators with the information necessary for making improvements.

At NRMCC Oakland, Treasure Island Branch Clinic, we used evaluation methodology in the planning and development phase of our weight loss program. By doing so we insured success and generated information useful for making improvements in subsequent programs.

We used preformative evaluation in the planning stages, (1) a kind of evaluation designed to improve the program. Our preformative evaluation involved determining need, demand, and then selecting the type of program that was affordable and effective.

Peculiarities common to the Navy tend to foster chronic obesity among Navy personnel and their dependents. (2) The sight of portly sailors and rotund dependents is commonplace at Treasure Island. Obesity is unhealthy and the Navy considers

TABLE 1. Components of Pilot Behavioral Weight Loss Program

No.	Components
1.	Weekly weigh-ins.
2.	Graphing weight change.
3.	Daily food diary.
4.	"Calories and Nutrition" discussion—presented by Nutritionist.
5.	Rules for changing eating and exercising habits.
6.	"Exercise" discussion presented by physical therapy technician.
7.	Discussion about exercise programs and equipment available at Treasure Island.
8.	Weekly exercise diary.
9.	Graphing the calories expended by exercising.
10.	Learning ideal body weight from measurements taken by physical therapy technician.
11.	Relaxation training.
12.	Assertiveness training.
13.	"Gaining Control Over Your Thoughts—such as guilt discussion.
14.	"Tips on Dining Out" discussion—presented by the nutritionist.
15.	The "Nutrition Myths" quiz.
16.	Slide-Tape presentation on "Eating Our Way to Our Grave."
17.	Eating a portion of the food brought to class and discarding the remainder.
18.	Weight Watchers, TOPS, and Overeaters Anonymous Information.
19.	Discussion program regarding sources of support that exist after this program.
20.	Dining out while under instruction to use as much of the material presented in this program as possible.
21.	Weekly meeting with a group that also wants to lose weight.

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TABLE 2. Rules for Altering Eating and Exercise Behaviors

1. From the last page of the self-analysis record, cut out three foods that are high in calories, eaten frequently, and are moderately preferred (rated 3).
2. Arrange to do all your eating (including snacks) in one room and in one place in that room.
3. Do not engage in any other activity while you are eating (including snacks) e.g., no TV, radio, etc.
4. For all meals and snacks you will eat at your designated place, (rule #2), set up a complete place setting to include plate, silverware, cup or glass, napkin, place mat.
5. Increase your mealtime by 5-10 minutes both by putting your utensils down and swallowing before going on to the next bite, and by putting your utensils down in the middle of the meal for a 2-minute delay.
6. Use smaller plates for all meals: Salad plates for dinner plates, custard cups for bowls, etc.
7. Write down five things you enjoy doing and substitute these activities when you feel you must eat.
8. Limit yourself to three meals and two snacks per day.
9. Still working to increase length of mealtime, count the number of chews it takes to consume your evening meal for this week only.
10. Plan your meals and snacks for the day before that day begins.
11. Remove all food from the house that requires no preparation.
12. Write down three to five exercises you enjoy doing and work to burn up 50-100 extra calories per day doing these exercises.
13. Look over the rules and redo any rule(s) that you have been having problems with.
14. Practice eating only one of any particular food item at a given mealtime, i.e., one potato, one pork chop, one cookie, etc. For bulk items, let $\frac{1}{3}$ cup equal one serving.
15. Memorize the caloric values of the foods appearing most often in your food diaries.
16. Increase your exercise so as to burn 100-200 extra calories per day.
17. Pick one meal per day for this week and deliberately leave a small amount of a desirable food on your plate.
18. When you finish eating or decide you have had enough, get up and leave the table.
19. Increase exercise so as to burn 150-300 extra calories per day.
20. Continue to leave deliberately a small amount of a desirable food on your plate. Extend it to two meals per day for this week only.
21. Go over the food eaten this past week and see if you can cut out two more high frequency, moderately preferred foods.
22. Increase exercise so as to burn 250-400 extra calories per day.
23. Practice the points of restaurant ordering by going out to dinner and bringing back the menu to share with the class. Write down the points that you followed while at dinner.
24. Stabilize exercise program so as to burn 300-500 extra calories per day.

personnel above the maximum allowable weight for their height to be unfit for duty. It was obvious that some effort had to be directed toward the Treasure Island community.

We publicized the possibility of a program in the base newspaper. The readers could return an enclosed coupon to indicate their interest and time preference. We also solicited interest by announcing the program in the Plan of the Day and the clinic medical newsletter.

After discovering that demand was strong enough to warrant both evening and afternoon sessions, we concentrated on development. The "strengths assessment" concept of evaluation encourages developers to examine available resources to define the range of possible program components.⁽³⁾ This is in contrast to the alternate approach of first deciding upon content and then attempting to locate the resources.

At the Branch Clinic, our resources included a Navy clinical psychologist and a Nurse Corps officer who were willing to spend the time establishing and operating the program. We also obtained medical officer support, a physical therapy department staffed by two technicians, meeting space, audiovisual equipment, duplicating capability, a supportive clinic administration, and a Navy nutritionist from the dietary department of the medical center.

We sampled the literature and decided to offer a program that provided information and directed activities to develop insights, attitude changes, and constructive alternatives to harmful eating and exercise behaviors (Table 1). Central was a series of 24 additive rules introduced over the program's duration to alter eating and exercise behaviors (Table 2).

Our initial groups met once a week for 8 weeks and achieved good results. Out of 27 patients who began, 19 attended six or more class sessions and were considered to have completed the program. Among those

who finished, the range of weight loss was 20 to -0.5 lbs., the median loss was 8.25 lbs., the mean loss was 9.32 lbs., and the standard deviation was 5.85 lbs. Our attrition rate and statistical results were similar to those of effective programs reported elsewhere in the literature.

Preformative evaluation helped us to make our program competitive from the beginning. By completing a needs assessment, which also gauged demand, we avoided the possibility of wasting effort developing and offering a program that met no legitimate need or was too poorly attended to be viable. By combining an accurate assessment of resources with an effective approach, we avoided the pitfalls of relying on resources outside our immediate control. The preformative evaluation process assured initial success.

Once the design was completed, we developed an evaluation method for making it even more effective. Formative evaluation during the de-

veloping phases enabled modifications to be made while the program was still fluid. (4)

Our process involved the use of a four-part analysis. Part one required the client to indicate how each of the program components (listed in Table 1) affected his/her efforts to lose weight. The client recorded his/her responses to the 21 components on part one of the Likert-like scale.

Parts two and three of the instrument were concerned with the 24 rules found in Table 2. Part two asked the client to rate the amount of difficulty he/she had in complying with each rule. The client recorded his/her responses on part 2.

Part three asked clients to indicate how much each of the rules helped them to control their eating and/or exercise behaviors. The clients recorded their responses to part three on a scale identical to the one used for part one.

Part four of the instrument had eight open-ended questions that were

directed at the program's process rather than content. The questions asked clients to comment on class meeting times, performance of staff members, class handouts, and asked for suggestions for improvements. Also included for possible correlation studies were two questions asking clients to indicate how much weight they lost or gained and how many classes they attended.

The completed instrument was distributed to every person who enrolled, whether they completed the program or not. To encourage candor we requested everyone to return their instruments anonymously through the mail. They were coded so that those not returning a completed one received an additional instrument with a second request to evaluate the program. Sixteen out of 27 clients returned a completed instrument. The vast majority returning them were clients who actually completed the weight loss program.

To determine the relative impact of

Part 1

greatly hindered	moderately hindered	slightly hindered	neither helped nor hindered	slightly helped	moderately helped	greatly helped
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Part 2

very difficult	moderately difficult	slightly difficult	neutral	slightly easy	moderately easy	very easy
(1)	(2)	(3)	(4)	(5)	(6)	(7)

TABLE 3. Program Components Rank Ordered by Client-Perceived Helpfulness at Contributing to Weight Loss

Rank	Component No. (see Table 1)	$\bar{X}$	SD	Totals
1	21	6.87	.52	$\bar{X} = 5.96$
2	16	6.73	.65	SD = .52
3	13	6.54	.66	
4	1	6.53	.83	99% Confidence
5	5	6.50	.65	Intervals for
6	3	6.50	.94	the Mean:
7	12	6.33	.98	5.62 - 6.30
8	2	6.27	1.03	
9	6	6.25	.97	
10	4	6.14	.77	
11	20	6.09	1.14	
12	14	6.08	.86	
13	19	5.82	1.17	
14	11	5.79	1.19	
15	8	5.75	1.42	
16	17	5.70	1.25	
17	15	5.54	1.05	
18	9	5.45	1.81	
19	10	5.29	1.44	
20	18	5.18	1.33	
21	7	4.92	.95	

each of our 21 components and 24 rules, we calculated a mean and a standard deviation for each item found in the first three sections of the instrument. We rank ordered all items on the basis of the magnitude of their means. This data can be found in Tables 3, 4, and 5.

The data from part one (Table 3) told us how our clients felt the program components compared to each other in affecting their efforts to lose weight. They felt that meeting with a

group of others who also wanted to lose weight and viewing the aversion therapy slide-tape presentation on "Eating Our Way to Our Graves" (5) were the first and second most significant aspects of the program. The least helpful components were a discussion about the availability of exercise programs and equipment at Treasure Island, and a discussion about other existing weight loss groups.

The data from parts two (Table 4)

and three (Table 5) of the instrument gave us similar information about the rules we introduced. Part two data indicated how the rules ranked in order of difficulty. Part three statistics provided information for determining the relative contribution each rule made toward effecting client control over eating and exercise behaviors.

The distinct advantage to rank ordering responses to each of the items in parts one, two, and three of the instrument is that it produced a method of making relative the impact of each item. We were able to determine which parts of the program our clients found to be most helpful and most difficult. We were also able to determine those parts that were the least helpful and least difficult. With this information, we can improve our program by expanding and/or retaining components and rules that are responsible for positive effects while reducing and/or eliminating those that have small or negative effects.

Though it appears to be directly useful, the rank ordering of components must be interpreted carefully. To answer the question, "When does a program component have a mean extreme enough to consider changing the component?," we established 99 percent confidence intervals. (6) The confidence intervals helped determine at what points, considering the entire sample distribution, the means became significantly different from a population represented by the sample data. In part one (Table 3), a component with a mean greater than 6.30 or less than 5.62 came under close scrutiny. Components with the large extreme means were considered to be very helpful at producing weight loss while those with small extreme means were considered to be of questionable effectiveness. Those components falling outside the confidence intervals are being considered for alteration.

We also focused on standard deviations because the standard

deviation of a component indicates degree of consensus on the effectiveness of specific components. The larger the standard deviation, the less of a consensus, and vice versa. Hopefully, one of the major strengths of a multifaceted program such as ours is that it offers something for everyone (even though we know that all the material will not affect everyone equally). One should expect large variations in standard deviations because the diverse material affects clients differently. Caution must be exercised in eliminating components that fall into the extremely ineffective range if their standard deviations are large because one still must reach the client for whom the component is effective. However, components with small standard deviations that are in the extremely ineffective range will have a high likelihood of being altered or eliminated.

In applying this process to the data from part one of the instrument, we found seven components ($\bar{x} \geq 6.30$) in the extremely effective category. None had large standard deviations; therefore, there seemed to be a strong consensus that these components effectively helped our clients to lose weight. Of the seven components, four (nos. 16, 13, 5, and 12) are amenable to expansion. These are the aversion therapy (slide-tape presentation), the discussion of guilt, the 24 rules, and the assertiveness training. Rules alteration will be based upon the more definitive data obtained from parts two and three of the instrument. Based on this evaluation process, we will offer an additional form of aversion therapy and spend more time soliciting client involvement in the guilt and assertiveness topics.

From the rank ordered data from part one, we also found five components in the extremely ineffective range ($\bar{x} \leq 5.62$). Three (Nos. 18, 10, and 9) having relatively large standard deviations are the information about other weight loss programs, obtaining ideal body weight, and

Rank	Rule No. (see Table 2)	$\bar{X}$	SD	Totals
1	9	1.83	1.47	$\bar{X} = 3.92$ SD = 1.10
2	3	2.06	2.05	
3	10	2.17	1.59	99% Confidence Intervals for the Mean: 3.27 - 4.57
4	24	2.85	2.08	
5	22	2.92	2.02	
6	2	3.27	2.40	
7	20	3.36	1.86	
8	4	3.38	2.02	
9	17	3.42	1.85	
10	5	3.53	2.42	
11	19	3.71	1.54	
12	11	3.79	2.72	
13	14	3.83	2.17	
14	21	3.89	1.83	
15	1	4.17	1.95	
16	13	4.33	1.61	
17	16	4.36	1.65	
18	7	4.40	1.80	
19	18	4.80	1.82	
20	12	4.92	1.61	
21	6	5.23	2.01	
22	15	5.42	1.56	
23	8	5.43	1.47	
24	23	6.00	1.15	

graphing caloric exercise expenditure. We will retain these components because they are helpful for some clients, but intend to do so at lower cost to the program and/or clients for whom they are not so effective. We decided to relegate the other weight loss programs information to a printed handout, eliminating most of the class time previously required. Obtaining ideal body

weight and graphing caloric expenditure has become optional. The remaining two program components (Nos. 7 and 15) falling into the extremely ineffective category, the availability of exercise programs discussion, and the nutrition myths quiz, will either be dropped or completely revised.

A similar process of establishing confidence intervals can be used for

the rank ordered data of parts two and three of the instrument (Tables 4 and 5, respectively). However, the program rules affecting eating and exercise behaviors are not as easily altered as are the program components. Essentially, rules can either be retained or eliminated. They are not readily amenable to either expansion or reduction of their effects. Therefore, in the evaluation of the pilot

program, we focused primarily on rules that were rated to be both extremely difficult to follow ($\bar{x} \leq 3.27$) and extremely unhelpful in controlling eating and exercise behaviors, ($\bar{x} \leq 5.35$). Rules number nine and ten will be eliminated. Rule number nine will be eliminated. Rule number ten will be retained until we see if subsequent clients rate it similarly. Presently, we are convinced that

planning meals and snacks at the beginning of each day is a rule that should be effective at helping clients to control their eating, despite the ratings of the clients from our pilot program.

It is important to note that the data collected and the changes we intend to make in our program may or may not be directly applicable to others operating weight loss programs. Unlike researchers who carefully attempt to determine the breadth to which their results can be applied, in our role as evaluators, we have sought to make program-specific changes. The data and the program changes we plan to make as a result of completing this evaluation are shared for the purpose of illustrating the use of our evaluation process.

The above described evaluation process has many virtues. The preformative evaluation efforts determined that an actual need and demand existed in our community for a program to help obese Navy personnel and their dependents to lose weight. Preformative evaluation also helped match our resources with what was required, insuring an affordable, practical, and effective program. The formative evaluation process provided the concrete data for making precise alterations. By using the same evaluation process on subsequent programs, it will be possible to monitor both the effects of our alterations and the effects of introducing new weight loss techniques to the program.

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5. Spence WR: Obesity: *Eating Our Way to Our Graves: A Health Education Slide Program*, 529826, Waco, Texas, Spenco Medical Corporation.
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TABLE 5. Program Rules Rank Ordered by Client-Perceived Helpfulness at Controlling Eating and Exercise Behaviors

Rank	Rule No. (see Table 2)	$\bar{X}$	SD	Totals
1	16	6.36	.67	$\bar{X} = 5.63$ SD = .47
2	15	6.36	.92	
3	18	6.31	.75	99% Confidence Intervals for the Mean: 5.35 - 5.91
4	2	6.29	.83	
5	19	6.00	.85	
6	4	6.00	1.00	
7	1	5.85	.69	
8	17	5.80	1.14	
9	24	5.78	1.09	
10	12	5.77	1.01	
11	22	5.70	.95	
12	6	5.67	1.30	
13	11	5.58	1.73	
14	7	5.57	1.02	
15	8	5.54	1.27	
16	5	5.50	1.02	
17	3	5.46	1.51	
18	21	5.38	1.30	
19	23	5.33	.95	
20	14	5.33	1.44	
21	20	5.27	1.19	
22	13	5.18	.60	
23	10	4.73	1.10	
24	9	4.55	1.69	

Notes & Announcements

IN MEMORIAM

LCDR *John R. Lamb*, DC, USNR, died 10 April 1982 in San Diego, CA.

Born 20 April 1946 in Jacksonville, FL, LCDR Lamb received his D.D.S. degree from Emory University, Atlanta, GA, in 1975. He completed his training in oral and maxillofacial surgery at Emory University in 1978.

LCDR Lamb was commissioned in the Navy Dental Corps on 1 Sept 1981. He was stationed at NRDC San Diego at the time of his death.

LT *Charles W. Gehrke, Jr.*, MC, USNR, died 1 March 1982 while on a flight training mission from the Naval Air Station, Whiting Field, Milton, FL.

Born 27 May 1947 in Marshall, MO, LT Gehrke received his B.S. degree from the University of Missouri and his Doctor of Osteopathy from the University of the Health Sciences, Kansas City, MO, in 1980.

LT Gehrke was stationed at the Naval Aerospace Medical Institute, Pensacola, FL, in the student flight surgeon program at the time of his death. He was posthumously designated a Naval Flight Surgeon on 1 March 1982.

FORENSIC PATHOLOGY TRAINING

The Armed Forces Institute of Pathology (AFIP) will offer 1 year of advanced residency training in the special field of forensic pathology. The residency is available to active duty medical officers of the Army, Navy, and Air Force, who are diplomates of the American Board of Pathology in anatomic pathology (preferably in both anatomic and clinical pathology) or eligible to take these examinations. There are positions available for the 1983-84 residency year.

Applications must be submitted by 15 Aug 1982 in accordance with BUMEDINST 1520.10G and BUMED-NOTE 1520.

Interested personnel should contact: CAPT Robert L. Thompson, MC, USN, Department of Forensic Sciences, Armed Forces Institute of Pathology, Washington, DC 20306. Telephone: Autovon 291-3287, Commercial (202) 576-3287).

SCIENTIFIC EXPERIMENTS

The Massachusetts Institute of Technology will offer a course in Design and Analysis of Scientific Experiments 12-17 July 1982.

Applications will be made to the physical, chemical, biological, medical, engineering, and industrial sciences,

and to experimentation in psychology and economics.

Further information may be obtained by writing to: Director of Summer Session, Room E19-356, Massachusetts Institute of Technology, Cambridge, MA 02139.

FLIGHT SURGEON WANTED

The Navy Flight Demonstration Squadron will need a flight surgeon beginning January 1983.

For information write: Navy Flight Demonstration Squadron, Blue Angels, NAS Pensacola, FL 32508 or call LCDR Wand or LCDR Boor, Autovon: 922-2583, Commercial: (904) 452-2583.

MANNITOL STORAGE UPDATE

The December 1979 issue of *U.S. Navy Medicine* presented an article written by LT C.F. Hostettler, MSC, proposing the use of a styrofoam hot box to stop crystallization of 25 percent mannitol injection. Since that time new information indicates that pentane gas, used as an expander in the production of styrofoam, is extremely flammable. For this reason styrofoam should not be used.

A standard laboratory incubator, although more expensive, is still the best means of maintaining solubility of mannitol injection.

USS NORTON SOUND REUNION

There will be an 11th annual reunion of the USS *Norton Sound* Association 29 July-1 Aug 1982 in Port Hueneme/Point Mugu/Oxnard, CA.

The association is a nonprofit organization comprised of former and present crewmembers who served on USS *Norton Sound* (AVM-1).

For information write: USS Norton Sound Association, P.O. Box 487, Port Hueneme, CA 93041.

EDITOR SEEKS ARTICLES AND PHOTOS

U.S. Navy Medicine has always encouraged our readers to submit articles in the areas of their expertise or experience. We especially are looking for good black-and-white glossy photos to go along with those submissions (8" X 10" are best but 5" X 7" are also acceptable). If you have a manuscript and also happen to be good with a camera, we'd like to hear from you.

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